

points where six consecutive points of the curve lie in a conic. In the particular case where the given curve is a cubic, the last-mentioned species of singular points have been considered by Plücker and Steiner, and in the same particular case, the theory of the conic of five-pointic contact has recently been established by Mr. Salmon. But the general case, where the curve is of any order whatever, has not, so far as I am aware, been hitherto considered ;—the establishment of this theory is the object of the present memoir.

II. "On the Vertebral Characters of the Order Pterosauria (Ow.) as exemplified in the Genera *Pterodactylus* (Cuv.) and *Dimorphodon* (Ow.)." By Professor OWEN, F.R.S. &c. Received February 23, 1859.

(Abstract.)

After mentioning various considerations which have tended to invest the question of the vertebral characters of the Pterodactyles with peculiar interest ; above all, in reference to carrying out the comparison of their skeleton with that of birds ; the author alludes to the scanty information on the subject already on record, which—with the exception of a remark of Professor Quenstedt as to the apparently procœlian characters observed by him in a dorsal vertebra of *Pterodactylus Suevicus*, and the apparent want of the trochlear form in the cervical articulations of that animal—affords no available data for comparing the vertebral mechanism of these reptiles with that of other vertebrata adapted for flight ; he then gives a summary of his own observations, made, as opportunities presented themselves, for some years past.

From investigations of species of *Pterosauria* extending from the period of the Lias, as exemplified by the *Dimorphodon macronyx*, to the upper green-sand, as exemplified by the *Pterodactylus Sedgwickii* and *Pter. Fittoni*, the author has ascertained the fact, that, with respect to the cervical and dorso-lumbar vertebræ, the terminal articular surfaces of the vertebral bodies are simply concave anteriorly and convex posteriorly, and that they consequently manifest the earliest known instance of the "procœlian" type which now prevails in the reptilian class. But in no other reptile are those arti-

cular surfaces so narrow vertically, in proportion to their breadth, as they are in the cervical vertebræ of the *Pterosauria*: in the dorsal series the cup and ball present more ordinary Saurian proportions.

Besides these principal and more general characters, those also which distinguish the vertebræ of the several regions of the spine, together with the specialities of the atlas and axis, and of other individual vertebræ, are pointed out and described.

The Paper is illustrated by numerous figures, which (excepting two from the *Aptenodytes*) belong to the Pterodactyle.

*March 31, 1859.*

Sir BENJAMIN C. BRODIE, Bart., President, in the Chair.

The following communications were read :—

- I. "The Higher Theory of Elliptic Integrals, treated from Jacobi's Functions as its basis." By F. W. NEWMAN, Esq., M.A., Professor of Latin in University College, London. Communicated by the Rev. Dr. BOOTH. Received March 3, 1859.

(Abstract.)

The peculiarly beautiful properties of these integrals, as treated by Jacobi and (in his two supplements) by Legendre, are obtained through so very elaborate and difficult a process, that few students can afford the time to study them. Professor De Morgan, in his 'Integral Calculus,' declines to enter even the Lower Theory, on the ground that the subject requires a detailed treatise. That in some sense it is analogous to trigonometry, which no one would desire to be treated fully in the differential and integral calculus, has been recognized by several writers. Legendre, in his second supplement, sixth section, took the first steps toward treating Jacobi's functions ( $\Lambda$  and  $\Theta$ ) on a wholly independent basis, by investigating their properties from the series which they represent: but after only two pages of this sort, he aids his research by assuming their relations